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# How Emotion Communication Guides Reciprocity:

# Establishing Cooperation Through Disappointment and Anger

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Abstract

Emotions fulfil many social functions, but data on their essential function of establishing cooperation are lacking. We investigated how communicating anger and disappointment guides reciprocal cooperative behavior. Although anger may force cooperation by announcing retaliation, we predicted that communicating disappointment was less likely to backfire. A laboratory study in which participants played against the reciprocal strategy of tit-for-tat showed that communicated disappointment established more cooperation than did anger. This effect also carried over to future cooperation decisions. Partners communicating disappointment evoked less anger, were evaluated more positively and as forgiving rather than retaliatory. Communication of disappointment thus appears conducive to establishing mutually beneficial relationships.

# How Emotion Communication Guides Reciprocity: Establishing Cooperation Through Disappointment and Anger

Developmental, cultural, evolutionary and social psychologists alike have started to recognize that obtaining an adequate understanding of emotions requires taking into account the social environment in which emotions are elicited (Campos, Campos, & Barrett, 1989; Markus & Kitayama, 1991; Morris & Keltner, 2000; Tooby & Cosmides, 1990). Accordingly, scholars have shifted their focus to the important social functions that emotions fulfill by coordinating interpersonal relations (Frijda & Mesquita 1994; Keltner & Haidt, 1999; Oatley & Jenkins, 1992). In this view, emotions communicate specific intentions to interaction partners, which may help in overcoming interpersonal challenges—perhaps most notably the problem of *cooperation* (Bowles & Gintis, 2002; Keltner, Haidt, & Shiota, 2006).

Cooperation is a decisive organizing principle of society, be it in hunter-gatherer tribes or complex nation-states (Nowak, 2006). Yet establishing and maintaining cooperation is problematic, because unconditional cooperators who invest costly time, effort or resources in others are vulnerable to exploitation by defectors. *Reciprocity*, or returning helpful and harmful actions in kind, represents a behavioral adaptation to this problem because it promotes cooperation by having cooperators retaliate against defectors (Parks & Rumble, 2001; Sheldon, 1999; Trivers, 1971). But because misunderstandings, ambiguous situations and unknown intentions greatly increase the complexity of reciprocity dynamics, scholars have proposed that emotions function as an indispensable and ubiquitous lubricant to establish and maintain cooperation (McElreath et al. 2003; Van Lange, Ouwerkerk, & Tazelaar, 2002).

Surprisingly, however, which discrete communicated emotions actually induce cooperation has (to our knowledge) never been tested empirically in the game-theoretical derivatives of reciprocal situations (i.e., prisoner's dilemma and give-some dilemma or—

more broadly—social dilemmas, see Weber, Kopelman, & Messick, 2004). Nevertheless, some scholars propose that *anger* may have evolved to address defection in an interaction partner (Fessler & Haley, 2003; Keltner, et al., 2006). Physiologically and cognitively, anger facilitates retaliatory action (Cannon, 1929; Lerner & Tiedens, 2006), making defectors more likely to cooperate because their costs of future defection are increased. But negotiation research suggests that communicating anger sometimes also has the opposite effect (Van Dijk, Van Kleef, Steinel, & Van Beest, 2008; Van Kleef & Côté, 2007). Through emotional contagion it may elicit anger in the target person (Hatfield, Rapson & Cacioppo, 1994), who may become more likely to retaliate instead. Anger may therefore also engender rapid escalation (Canary, Spitzberg, & Semic, 2007). Thus, communicated anger may force cooperation by announcing retaliation, but it can also backfire, yielding mutual defection and an interpersonal crisis.

Although the theoretical debate of inducing cooperation in others has mainly focused on the antagonistic emotion of anger, we believe there is another largely overlooked emotion that seems relevant to this purpose: *disappointment* (Frijda, 1986; Van Dijk & Van Harreveld, 2008). Disappointment is experienced in response to unfulfilled positive expectations (Van Dijk, Zeelenberg, & Van der Pligt, 1999). Expressing disappointment to the person that caused this emotion therefore communicates that one had higher expectations of this person. It is this message rather than its action tendency that makes disappointment effective in inducing cooperation, because disappointment is associated with a tendency to do nothing (Van Dijk & Van Harreveld, 2008). Still, expressing disappointment in someone is a powerful statement that can even elicit concessions from negotiation partners (Timmers, Fischer, & Manstead, 1998; Van Kleef, De Dreu, & Manstead, 2006; Van Kleef & Van Lange, 2008). And exactly because it addresses defection without communicating a prospect of retaliation, as anger does, it is less likely to backfire. Our central hypothesis therefore is

that reciprocal actions more successfully establish cooperation when one responds to defection with disappointment instead of anger.

## The Present Study

We will test our hypothesis by letting participants play a give-some dilemma (see below) against a Tit-For-Tat (TFT) strategy. This strictly reciprocal strategy has become famous for establishing cooperation by always cooperating at its first move and subsequently mirroring its partner's actions (Axelrod, 1984). By doing so, it is *retaliatory* because it responds to defection with defection but also *forgiving* because it resumes cooperation after defection when its partner does so too. Because anger and disappointment may elicit perceptions of retaliation and forgiveness too, these emotions could strongly influence the effectiveness of TFT. Finally, we will examine if any effects of these emotions will carry over to future interactions with the same partner in another context.

### *Method*

*Participants and experimental design*. Ninety-seven undergraduate students (22% male, average age = 20.08) participated in exchange for €3.50 (approximately $5) or course credits. Participants were randomly assigned to the disappointment, anger or no-emotion condition.

*Procedure*. Upon arrival at the laboratory, participants were seated in separate cubicles in front of a computer. For our experiment we adjusted the paradigm used by Van Lange et al. (2002). Participants read that in every trial they and their partner, who was actually computer-simulated, would start with 10 coins and that they both had to decide simultaneously how many coins they wanted to donate to the other. Each coin kept to oneself was worth €0.50; coins donated to one's partner were worth €1.00. This situation represents a give-some dilemma because keeping one's coins yields higher individual outcomes than donating one's coins, yet if both players follow this strategy, each individual obtains lower

outcomes than if they both donate all their coins. Participants who obtained more money with the game had higher chances to win one of several €10 prizes. Subsequently, every participant played for 14 trials against a TFT-strategy that donated 10 coins in the first trial and subsequently imitated the participant's donations.

*Emotion manipulation*. Participants read that either they or their partner, if desired, could send the other player emotion messages every three rounds. Participants therefore first practiced in composing messages by selecting an emotion label and indicating to what extent they experienced this emotion on a scale of 0 (not at all) to 10 (very much). To warrant the credibility of the emotion communication we emphasized that it was perfectly fine to communicate a specific emotion several times or with minimal intensity. Subsequently, their partner was seemingly at random appointed to send messages. After the second, fifth, eighth and eleventh trial participants in the anger and disappointment conditions would then receive a message reading that their partner felt *angry/disappointed* about the number of coins they had donated. It was clearly stated that the first emotion message pertained to the first two rounds and the subsequent emotion messages to every three preceding rounds. Participants in the no-emotion condition received no messages. To make the emotion information more realistic we covaried its communicated intensity with the number of donated coins. If participants had donated ten coins in the previous three trials the intensity was 0 out of 10—indicating that their partner did not at all feel angry or disappointed—and if participants had donated fewer coins the intensity increased to ultimately 10 out of 10 when no coins were donated.

*Dependent measures*. Our main dependent behavioral measure was the number of coins participants donated to their partner in each trial. To explore if the communicated emotions would also spill over to cooperation decisions in a different context, we gave participants the opportunity to affect their partner's (and thereby also their own) chances in

the lottery. They could anonymously decide to let their partner's number of tickets increase or decrease with 0 to 10%. Afterwards, we also asked a series of questions on a 7-point scale (1 = totally disagree, 7 = totally agree). Seven items were used to measure participants' impression of their partner (Van Kleef, et al. 2006; e.g., "my partner made a cooperative impression", "during the game, my partner made a hostile impression"). Retaliation perceptions were measured with the items "My partner will react fiercely when something is done to him or her", "My partner will not retaliate if damage is caused to him or her" (reversed), and "My partner will take action if he or she is disadvantaged" ($\alpha = .68$). Perceived forgiveness was measured with the items "my partner is forgiving" and "my partner will not easily let a conflict get out of hand"; $r = .39$, $p < .001$. Participants were also asked how angry they felt. Furthermore, we asked in both emotion conditions if participants found it justified that their partner felt as he or she had communicated, and if participants could imagine their partner's feelings ($r = .95$, $p < .001$). The emotion manipulation was checked by asking participants how often their partner communicated fear, shame, happiness, envy, pride, sadness and, importantly, anger and disappointment (1 = not at all, 7 = very often). Finally, participants were debriefed, paid and thanked.

*Results*.

*Manipulation check*. Separate one-way ANOVAs on the anger ($F[2, 94] = 54.64$) and disappointment ($F[2, 94] = 52.86$) manipulation checks yielded strong effects of emotion (both $p$s $< .001$; both $\eta^2$s $> .52$). Communicated anger was reported most often in the anger condition ($M_{anger} = 5.10$, $SD = 2.61$ vs. $M_{\text{disappointment}} = 1.06$, $SD = 0.36$ and $M_{\text{no emotion}} = 1.60$, $SD = 1.22$; both $t$s $> 8.54$, both $p$s $< .001$) and communicated disappointment was reported most often in the disappointment condition ($M_{\text{disappointment}} = 5.26$, $SD = 2.38$ vs. $M_{\text{anger}} = 1.13$, $SD = 0.72$ and $M_{\text{no emotion}} = 1.89$, $SD = 1.57$; both $t$s $> 8.09$, both $p$s $< .001$).

*Cooperation*. We pooled the post-manipulation trials in four blocks by calculating the average contributions in the three trials following each emotion communication and conducted a 3 (emotion) × 4 (blocks) mixed-model ANOVA. In this and subsequent analyses we controlled for any pre-manipulation differences in cooperation by including the average contribution in the first two trials as a covariate. Results revealed an overall interaction, $F(2, 93) = 3.01$, $p = .05$, $\eta^2_p = .06$ (see Figure 1). Post-hoc comparisons showed that cooperation increased faster when disappointment as opposed to anger ($F[1, 59] = 3.90$, $p = .05$, $\eta^2_p = .06$) or no emotion ($F[1, 63] = 5.08$, $p = .03$, $\eta^2_p = .07$) was communicated. Moreover, linear trend analysis revealed that communicating disappointment gradually increased cooperation ($F[1, 29] = 5.61$, $p = .02$, $\eta^2_p = .16$) whereas anger and no emotion did not (both $F$s < 1, both $p$s > .43). Finally, a one-way ANOVA on the last block of trials showed a main effect of emotion, $F(2, 93) = 3.95$, $p = .02$, $\eta^2 = .06$. Disappointment established more cooperation than anger ($p = .007$) with no emotion inducing intermediate cooperation in comparison to anger and disappointment (both $p$s > .12).

To examine any spill-over effects in the give-some dilemma we conducted a one-way ANOVA on the percentage with which participants decided to increase or decrease the other's lottery tickets. Results showed a main effect of emotion, $F(2, 93) = 3.35$, $p = .04$, $\eta^2 = .06$. Post-hoc tests revealed that people allocated a more positive outcome to their partner when disappointment ($M = +6.24\%$) was communicated as opposed to anger ($M = +2.34\%$, $p = .01$) or no emotion ($M = +3.37\%$, $p = .06$).

*Emotion inferences*. To test whether anger and disappointment affected retaliation and forgiveness perceptions, we conducted 3 (emotion) × 2 (perception: forgiving vs. retaliatory) mixed-model ANOVA. This yielded a significant interaction, $F(2, 93) = 5.35$, $p = .006$, $\eta^2_p = .10$ (see Table 1 for all means and standard errors). Simple-effect analyses showed that disappointed partners were perceived as more forgiving than retaliatory ($p = .006$), whereas

for angry partners the opposite trend occurred, indicating they were perceived as relatively retaliatory ($p$ = .15). Moreover, planned comparisons showed that angry partners were perceived as more retaliatory than partners in the disappointed ($p$ = .05) and no-emotion conditions ($p$ = .06) and as less forgiving (both ps < .02).

Separate one-way ANOVAs showed main effects of emotion on reported anger ($F$[1, 93] = 7.64, $p$ < .001, $\eta^2$ = .14) and impression of the opponent ($F$[1, 93] = 12.47, $p$ < .001, $\eta^2$ = .19). Post-hoc analyses revealed that partners communicating disappointment ($M$ = 6.11) or no emotion ($M$ = 5.84) received a more favorable impression than partners communicating anger ($M$ = 4.98; both $p$s < .001). Furthermore, angry partners induced more anger in participants ($M$ = 1.84) than partners communicating disappointment ($M$ = 1.02) or no emotion ($M$ = 1.10; both $p$s < .001). Finally, participants evaluated communicating anger or disappointment as equally justified ($M_{\text{disappointment}}$ = 4.89, $M_{\text{anger}}$ = 4.54, $F$ < 1, $p$ = .42) and one sample $t$-tests showed that these ratings differed significantly from the midpoint of the scale ($t$[61] = 3.06, $p$ = .003). These findings further indicate that the manipulation was credible and that differences in perceived appropriateness between both emotions cannot explain our findings.

*Discussion*

The present study investigated if the communication of discrete emotions is conducive to establishing cooperation when an interaction partner refrains from returning a favor. The results show that communicating disappointment in the other more successfully induces cooperation than does communicating anger or not communicating any emotion. Disappointed partners were perceived as forgiving rather than retaliatory, whereas the opposite was true for angry partners. Anger thus risks escalation, whereas disappointment emphasizes the possibility of obtaining better outcomes. Moreover, this behavioral effect carries over to future social decision-making with the same interaction partner.

Our point is not that communicating an intention to retaliate is necessarily detrimental. After all, reciprocation implies retaliation and TFT would be unsuccessful without it. But our results do show that addressing defection by communicating anger clearly overemphasizes retaliation. Not only did it evoke anger, participants also had a less positive impression of their partner. Expressing disappointment, however, is an attempt to address defection without incurring such costs. And in that it appears quite successful—at least when, like in the present study, its communication is experienced as appropriate. Moreover, because communicating disappointment does not lead to negative impressions, expressing anger still remains a viable option when disappointment fails to induce cooperation.

Even though we believe the importance and benefits of disappointment have not yet been fully appreciated in the emotion and cooperation literature, we do not want to suggest that it always induces more cooperation than anger does. For example, because anger more strongly emphasizes retaliation than disappointment does, it may be quite effective in averting defection when one's partner fears retaliation. In our experiment communicating anger may have resulted in escalation because both players had equal retaliatory power, but when in asymmetric give-some dilemmas the more powerful person communicates anger this may actually promote cooperation (cf. Van Kleef & Côté, 2007). Taken together, these results show that how people establish and maintain cooperation can only be fully understood by recognizing that communicated emotions are inherent to the dynamics of reciprocity.

To conclude, the next time someone fails to return a favor, it seems wise to reciprocate this action while communicating disappointment instead of anger. This emphasizes potential forgiveness rather than retaliation, thereby maintaining a good relationship with the other instead of evoking anger. But above all, communicating disappointment is more likely to establish a mutually beneficial relationship.

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Figure 1.

*Number of donated coins as a function of emotion and block. Error bars depict standard error per condition.*

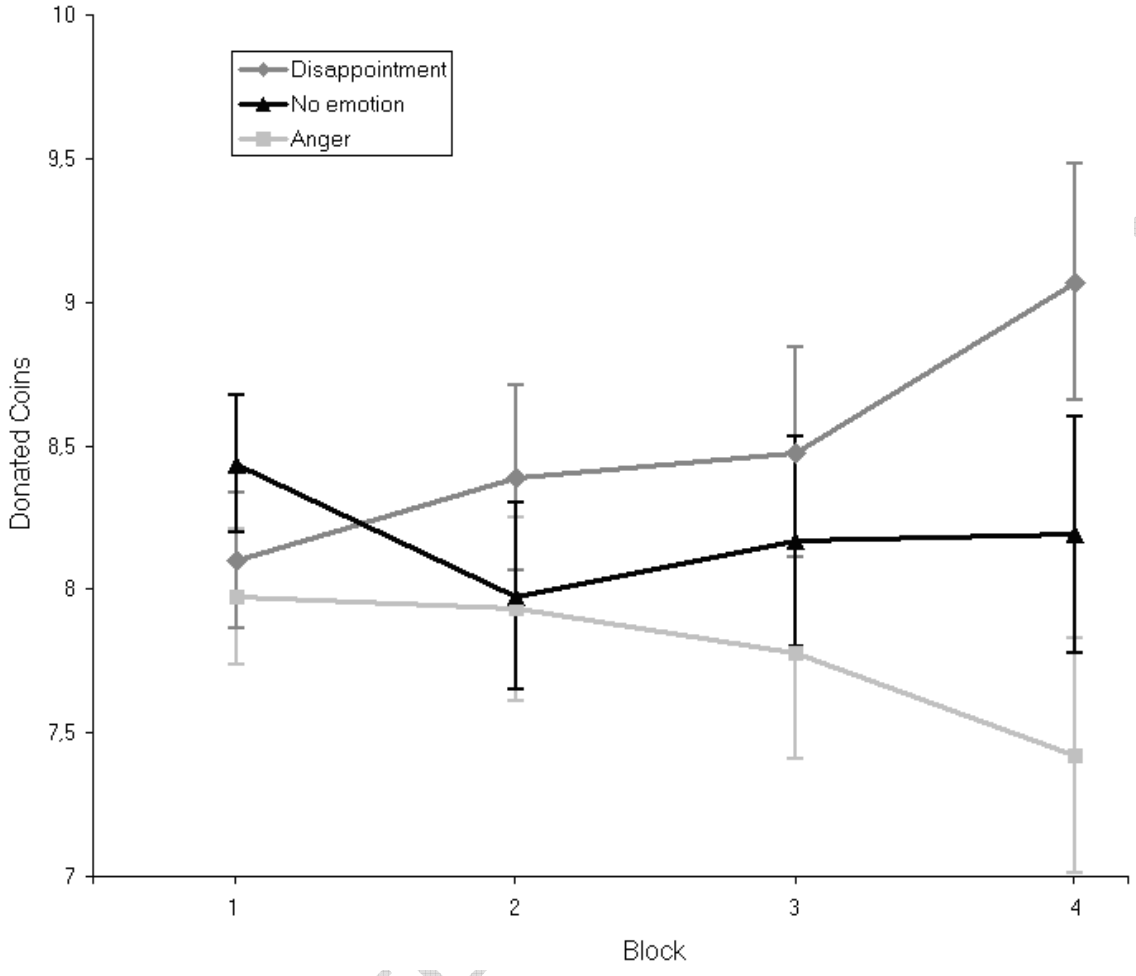

Table 1

*Retaliation and Forgiveness Perceptions by Emotion*.

| | Dependent variables | |
|---|---|---|
| Emotion | Retaliation | Forgiveness |
| Anger | $4.73_{a}$ (0.18) | $4.22_{a}$ (0.24) |
| Disappointment | $4.21_{b}$ (0.19) | $5.21_{c}$ (0.24) |
| No emotion | $4.25_{ab}$ (0.17) | $4.98_{c}$ (0.23) |

*Note.* Entries are means on 7-point scales, with higher values indicating higher retaliation or forgiveness perceptions. Standard errors are given in parentheses. Means in the same row or column with a different subscript differ at $p \leq .05$.